Chapter 9
Maintenance Shop

9-1. General

Maintenance shops are provided in powerhouses to facilitate preventive maintenance and to provide moderate repair capability. The intent is that each powerhouse have the capability to take care of the average work promptly and efficiently. Capability for all possible required repairs is not intended even in the most well-equipped shop as factory replacements or contract work can be more practical. Normally, the operations divisions will determine the requirements for hand tools and portable equipment, and procure all equipment. The maintenance shop layout should provide adequate space and power for both initial and future requirements of installed and portable equipment. Most powerhouses will require an in-house shop. However, shops may be omitted where an adequately equipped project shop is to be provided outside the powerhouse at a nearby location, or where a small powerhouse is located close enough to an adjoining project with an adequate maintenance facility to permit practical joint usage.

9-2. Shop Room

a. Location. A location close to the erection area and on the same elevation is preferred. Convenient transfer of material, equipment, and parts from the powerhouse bridge crane and trucks to the shop transporting facility should also be planned. The location should permit the shop to be enclosed and be provided with a large access door permitting free movement of material and the transporting facility.

b. Area. Shop area should provide adequate space for the planned equipment with consideration for the following: size and configuration of pieces to be worked on; space for dismantling and reassembly; and space for safe, efficient movements of personnel. An area of about 75-95 m^2 (800-1,000 ft^2) should be the minimum area for a reasonably equipped shop in a small plant. An area of 150-170 m^2 (1,600-1,800 ft^2) may be justified for a large multiunit plant or a central facility serving several small projects. An adjoining area for a lockable tool and storage room should be available and should be a minimum of 10 m^2 (100 ft^2).

9-3. Equipment Selection

a. Factors. Factors affecting the selection of equipment include the following:

(1) Size of plant (volume of work).

(2) Physical size of parts to be repaired.

(3) Location of plant (access to other government or commercial facilities).

(4) Equipment cost (probable usage to justify investment).

(5) Available shop space.

(6) Personnel planning (type of equipment to be consistent with personnel skills).

b. Equipment guides.

(1) For small to medium powerhouses with well-equipped commercial or government shops available 1-4-hr travel time away, the following equipment, or equivalent, should be planned:

(a) 1.8-tonne (2-ton) floor crane.

(b) 300-amp welder.

(c) Welding hood and exhaust fan.

(d) 50-mm (2-in.) pipe threading machine (portable).

(e) 150- x 150-mm (6- x 6-in.) power hacksaw or bandsaw.

(f) 50-tonne (60-ton) press.

(g) 250-mm (10-in.) pedestal grinder.

(h) 380-mm (15-in.) floor-mounted drill press.

(i) 300-350-mm (12-14-in.) lathe.

(2) For large multiunit powerhouses, shops serving several projects, or for smaller powerhouses in remote locations, the following equipment, or equivalent, should be planned:

(a) 1.8-tonne (2-ton) floor crane.

(b) 300-amp welder.

(c) Welding hood and exhaust fan.

(d) 50-mm (2-in.) pipe threading machine (portable).

(e) 150- x 150-mm (6- x 6-in.) power hacksaw or bandsaw.

(f) 50-tonne (60-ton) press.

(g) 300-mm (12-in.) pedestal grinder.

(h) 200-mm (8-in.) bench grinder.

(i) 1.0-m (3-ft) radial drill press.

(j) 300-mm (12-in.) bench-mounted drill press.

(k) 450-mm (18-in.) engine lathe.

(l) 250-mm (10-in.) bench lathe.

(m) 0.2- × 1.0-m (10- × 40-in.) milling machine.

A 2.5-tonne (3-ton) bridge crane can be justified for heavy work volume shops.

9-4. Shop Layout

Machines should be located to provide good access for placing parts and materials in each machine. Repair-oriented shops normally require more free area around machines than production shops where specific operations can be scheduled. Space for two to four 1.0- x 3.0-m (3- x 10-ft) work benches will usually be required. Open floor area for assembly, disassembly, and short-term storage of parts is desirable. The welding area, burning area, and grinders should be away from precision machine work and assembly areas. Power should be provided for all fixed machines to be installed and for portable tools at benches and assembly areas.

9-5. Drawing

Figure B-6 is a layout of a shop typical of the type described in paragraph 9-3*b*(1).